

SUMMARY OF PROGRAM FOR DETERMINATION OF AEROMEDICAL ADAPTABILITY AND  
QUALIFICATION FOR SPECIAL PROJECTS

PROGRAM IS IN TWO PHASES: The Clinical Phase includes a detailed, physical examination and special laboratory tests; the second, consists of special Stress Tests and Psychiatric Tests.

The clinical phase consists of a complete, detailed history and physical examination by various clinical specialists, and special laboratory clinical studies consisting of:

Capillary Fragility Test  
Sigmoidoscopy  
Electrocardiographic Studies  
Vectordigram  
Phonocardiography  
Plethysmography  
Tilt Table Examination Studies  
Valsalva Test  
Pulmonary Functions, including Maximum Breathing Capability, Timed Vital  
Capability, and Nitrogen Wash Out  
Tread Mill Studies of Cardiopulmonary Response  
Ophthalmodynamometric Measurement of the Central Retinal Artery Diastatic  
Pressure  
Photographs of the retinal vasculature  
Koback Labyrinth Caloric Test  
Standard Neurological Test  
Electroencephalogram  
Radiographic Examination of the chest, upper G.I. Tract, lumbosacral spine,  
Protein Bound Iodine Testing, Blood Sugar, Serum, NA,K, Cl, HCO<sub>3</sub>, Ca and  
Phosphate  
Total Cholesterol  
Phospholipid  
Total Fatty Acids  
S.G.O. transaminase  
PSP, BSP  
Creatinine Clearance  
Stools - Ova & Parasites  
Sperm Count  
Urine 17 Ketosteroids  
Catecholamines  
Total Blood Volume  
Total Body Water  
Extra Cellular Space  
Total Body Radiation Count  
Clinical examination testing will require 9 days.

The Stress Tests examination consists of the following:

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The following 5-day stress testing program is planned at WADD for special project subjects in groups of two.

1. Acceleration

a. positive (headward) gravitational force from rest to maximum acceleration of 7 g's at an onset rate of 1 g per 15 seconds. Measurements of peripheral vision and cardiac activity are made.

b. Transverse (forward) gravitational force to 8 g's applied at a rate of 1 g each 5 seconds. Vital capacity determinations and electrocardiograms are performed.

2. Vibration

Pitch and roll is programmed on the equilibrium chair with stick control for the subject to attempt to maintain straight and level flight. Vertical vibration is superimposed on pitch and roll varying from one to ten c.p.s. The amplitude for each frequency of vertical vibration is predetermined to be about  $1/4 - 1/2$  g's from maximum tolerance derived from control data.

3. Heat

Thermal chamber for a 60 minute exposure of 160 degree F. and 7% relative humidity. Data recorded are body weight changes, serial electrocardiograms, blood pressures, and body temperature at 17 sites. Two measurements of performance are then calculated: The Craig Index (includes variable of sweat rate, pulse changes and temperature elevation) and heat storage in calories per square meter per hour. Best performances are related to the lowest score in both indices.

4. Physiology

a. MC-1 partial pressure suit stress tests with exposures for one (1) hour to an altitude of 65,000 feet.

b. Harvard Step Test.

5. Psychological - Psychiatric Evaluation

A. Measures of motivation and personality:

1. Psychiatric Interview - Two interviews are given by each of two psychiatrists. These are employed to evaluate the subject's personality structure, with emphasis on motivation and emotional stability. Attention is directed to past experience in order to define methods customarily employed by the subject for solution of life problems and for adaptation to environmental demands.

2. Rorschach Test - By observing the nature of a subject's associations to ten ambiguous ink blots, the psychologist is able to prove relatively deep levels of the personality. Important information on emotional conflicts and defense mechanisms can be obtained by analyzing what is seen and how it is seen.
3. Thematic Apperception Test - The subject is asked to tell stories suggested by a series of pictures. This test yields information about inter-personal relationships on a fairly deep level.
4. Draw-A-Person - By drawing male and female human figures, the subject gives information on his body image and feelings about his place in the world.
5. Sentence-Completed Test - This is a series of incomplete sentences which are completed by the subject. His choice of conclusions provides further personality data.
6. Minnesota Multiphasic Personality Inventory - An objective paper-and-pencil test which offers a description of personality based on responses to a 566-item questionnaire. (Optional if time permits.)
7. Who Am I - The subject is asked to write 20 answers to the question "Who am I?" This is interpreted projectively to give information on identity and perception of social roles.
8. Peer Ratings - Each candidate is asked to indicate which of the other members of the group who accompany him through the program he likes best, which one he would like to accompany him on a two-man mission and which one he would assign to the mission if he could not go himself.

B. Measures of intellectual functions:

1. Wechsler Adult Intelligence Scale: A relatively objective measure of eleven (11) verbal and performance measures yielding an "I. Q." score.

C. Response to Stress:

Isolation - Each subject to be confined to a locked, dark, soundproof room for two (2) hours. Isolation serves to identify subjects who cannot tolerate absence of external stimuli, enclosure in small spaces, or enforced inactivity.

WADD		5-day		Stress Testing Program	
		Subject #1		Subject #2	
Monday	8 AM	Harvard Step Test		Harvard Step Test	
	9 AM				
	10 AM	Anthropology		Anthropology	
	11 AM			MC-1 Test	
	1 PM	Thermal Stress			
Tuesday	8 AM	Acceleration (headward)		Acceleration (headward)	
	9 AM	Psychology		Psychiatry	
	1 PM	MC-1 Test		Thermal Stress	
Wednesday	8 AM	Acceleration (forward)		Acceleration (forward)	
	9 AM	Psychiatry		Psychology	
Thursday	8 AM	Psychiatry		Psychology	
	1 PM	Psychology		Psychiatry	
Friday	8 AM	Physiology		Physiology	